

AIRWAY MANAGEMENT

When you can't breathe, nothing else
matters

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Establishing A Patent Airway

- Chin Lift and Jaw Thrust Maneuver
- Oropharyngeal Airway
- Nasopharyngeal Airway
- Laryngeal Mask Airway
 - The above do not protect against aspiration and laryngospasm

Mask Ventilation

- Can Deliver A High FIO₂
- Avoids The Potential Trauma Of Intubation
- Does Not Protect Against Aspiration
- May Result In Gastric Distension
- Laryngospasm Can Occur
- Requires Use Of Both Hands

Oral/Nasal Intubation

- Safe and Common Practice in Patients Undergoing General Anesthesia
- Atraumatic Intubation requires Knowledge of Anatomy, Appropriate use of Equipment, and Drugs (Muscle Relaxants)

Preoperative Evaluation

- Patient History
 - Prior History of Difficult Intubation
 - Tumor of Head and Neck
 - Arthritis
 - Pregnancy
 - Trauma - C Spine, Full Stomach

Preoperative Evaluation

- Physical Examination
 - Tongue versus Pharyngeal Size
 - Atlanto - Occipital Joint Extension
 - Cervical Spine Mobility (normal 35 degrees)
 - Anterior Mandibular Space
 - Thyromental distance - normal is 6 cm
 - Dental Examination (Loose Teeth, Prostheses)

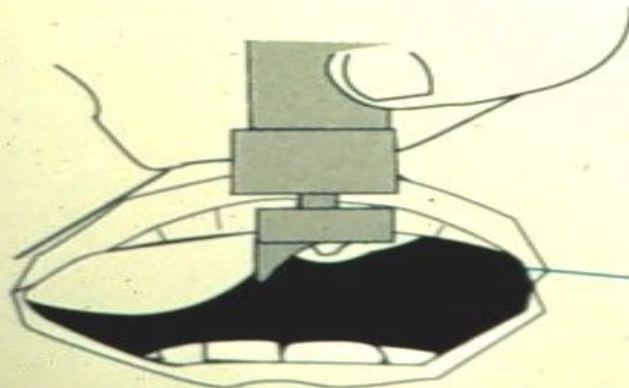
Checking for an Anterior Larynx



Distance from chin's inner rim to hyoid bone should = 3 fingers breadth in adult. If you only fit 2 fingers, expect anterior airway.



From side, patients with less than 2 finger breadth often appear to have hypoplastic mandibles (receding chins).



ARYTENOIDS

Anterior larynx: larynx appears anterior to your field of view. Here you see the arytenoids. Often you see no landmarks, making intubation difficult.

Checking for Mobility of Adult Jaw

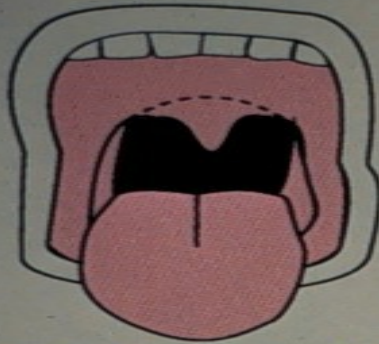


Can she open her mouth wide enough for 3 fingers? If not, you won't have room to insert your laryngoscope blade and visualize the larynx. Trauma, arthritis, tumor, or infection can limit mouth opening.

Have her place lower teeth outside upper teeth to check for ability of jaw to glide forward. This ability is often lost in patient with arthritis, before ability to open the mouth.

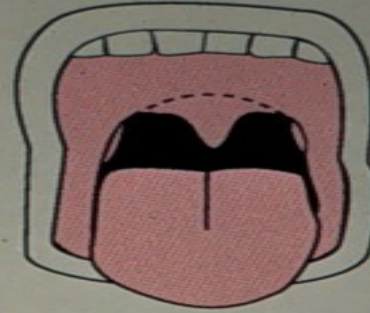


Mallampati Signs as Indicators of Difficult Intubation.



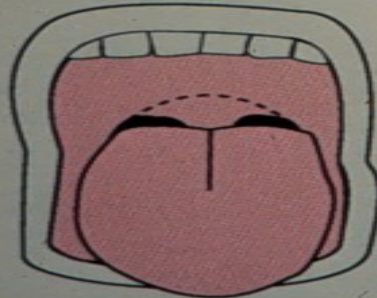
**Class I: soft palate, uvula,
fauces, pillars visible**

No difficulty



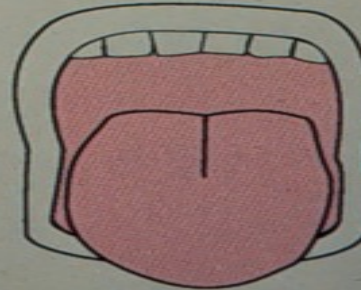
**Class II: soft palate,
uvula, fauces visible**

No difficulty



**Class III: soft palate, base
of uvula visible**

Moderate difficulty



**Class IV: hard palate
only visible**

Severe difficulty

Technique For Orotracheal Intubation

- Preparation And Equipment (Always Have Suction Available)
- Head Position - Alignment Of Oral, Pharyngeal, and Laryngeal Axes
- Choice Of Laryngoscope And Endotracheal Tube
- Possible Need For Awake Tracheal Intubation
 - Difficult Airway Algorithm

The Three Axes of the Larynx



Orotracheal Intubation

- Patient's Head At The Level Of The Xiphoid
- Sniffing Position
- Laryngoscope In *LEFT* Hand
- Open Mouth
- Hold Tracheal Tube In Right Hand Like A Pencil

Comparison of Curved and Straight Blades



CURVED

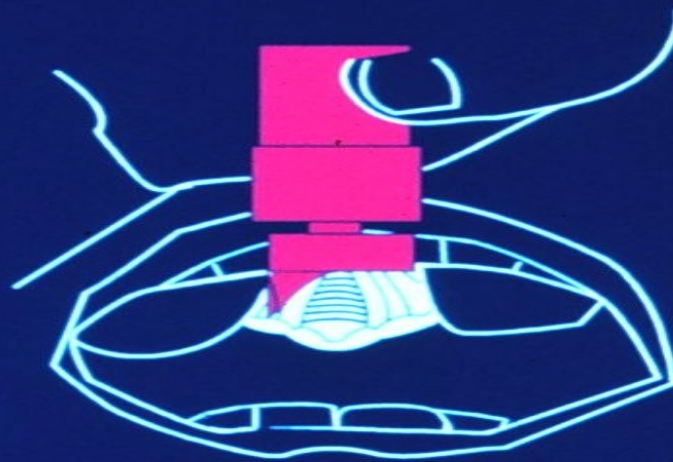
STRAIGHT

CURVED: A Macintosh. Tip lies in the vallecula, blade displaces tongue and tissues forward

STRAIGHT: A Miller. Tip lifts epiglottis, blade flattens tissues with less displacement. Useful in children, anterior larynx, obesity

Common Errors

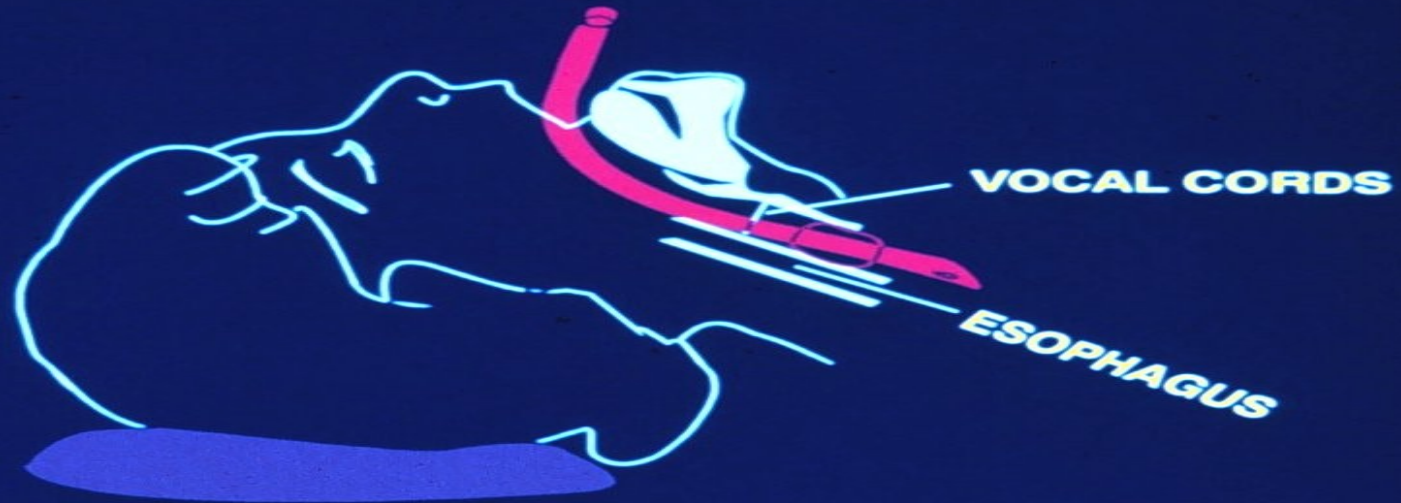
Don't leave blade in the middle of the tongue. Sweep tongue to the left.



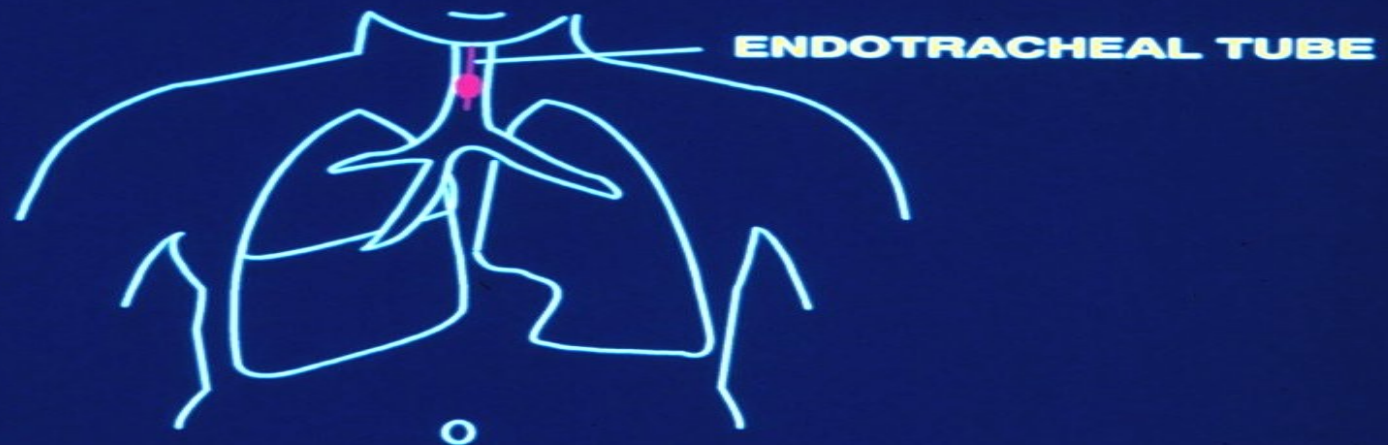
Push the blade as far to the left as possible to leave room to see the larynx and pass the tube.



Correct Position of the Endotracheal Tube



Cuff is below the cords, tip about mid-trachea.



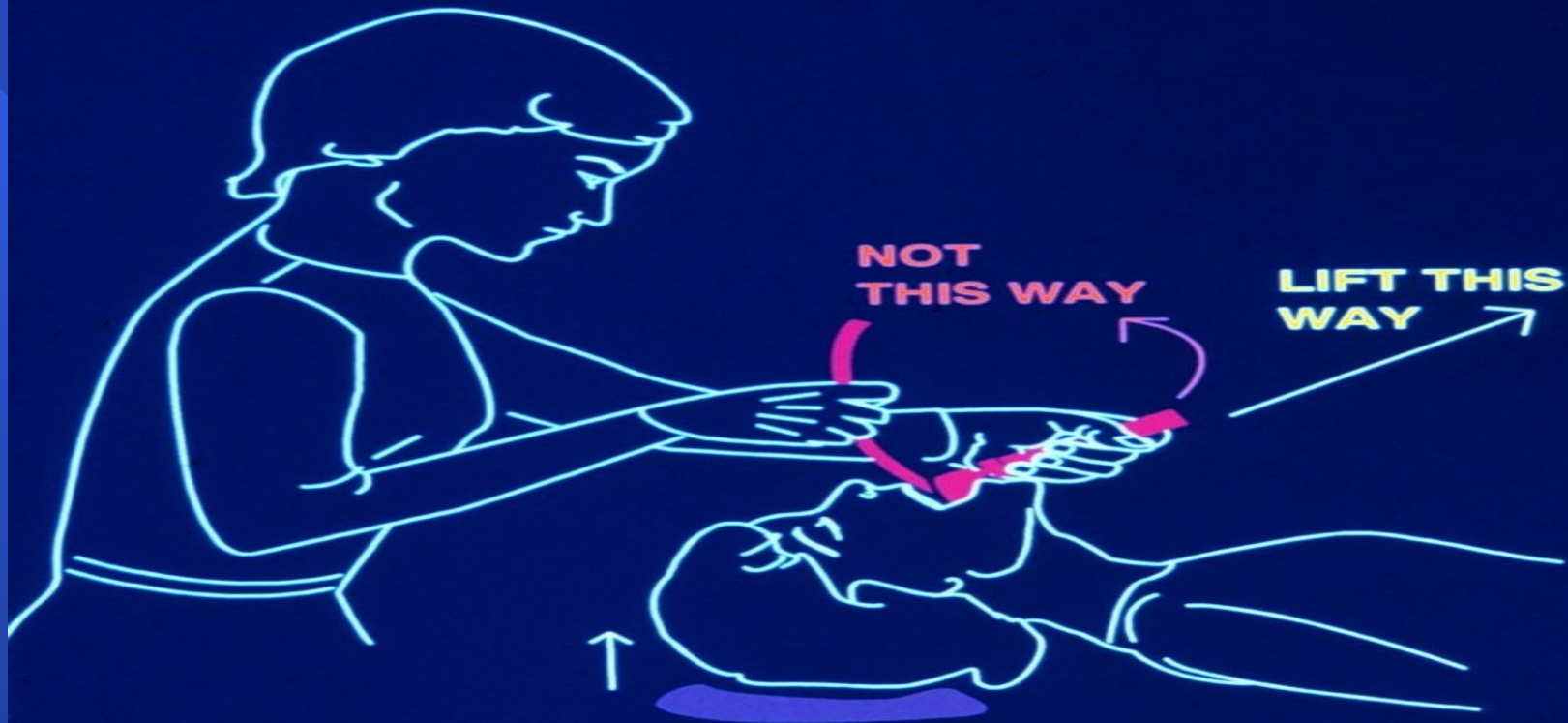
Proper positioning of endotracheal tube above carina

Common Errors



Lift upward, don't push on the teeth. Keep wrist stiff, elbow straight. Lift upward, don't rotate toward yourself.

Proper Laryngoscopy Technique



Back and left arm are straight. Lift upward toward intersection of the opposite wall and ceiling. Don't rotate your wrist and press on the upper teeth.

Awkward Technique



Don't stoop or bend your arm. You lose mechanical advantage, binocular vision, and maneuverability.

Complications Of Orotracheal Intubation (During)

- Dental And Oral Soft tissue Trauma
- Hypertension And Tachycardia
- Cardiac Dysrhythmias And Myocardial Ischemia
- Aspiration
- Corneal Damage

Complications Of Orotracheal Intubation (Intubated Patient)

- Tracheal Tube Obstruction
- Endobronchial Intubation
- Barotrauma
- Accidental Disconnect
- Tracheal Mucosa Ischemia
- Accidental Extubation

Immediate And delayed Complications On Extubation

- Laryngospasm
- Aspiration
- Pharyngitis
- Laryngeal Or Subglottic Edema
- Vocal Cord Paralysis
- Arytenoid Cartilage Dislocation

Alternatives To Orotracheal Intubation Under Anesthesia

- Awake Orotracheal Intubation
- Nasotracheal Intubation
 - Awake Blind Nasal
 - Nasotracheal Intubation After Induction
- Intubation With Fiberoptic Bronchoscope
 - Awake versus Under Anesthesia
 - Orotracheal versus Nasotracheal
- Retrograde Intubation

Verification Of Correct Tube Placement

- Symmetric Chest Movement
- Symmetric Breath Sounds
- End tidal Carbon Dioxide
 - Greater Than 30 For 3-5 Breaths
- Condensation Of Water In The tube
- Palpation Of Cuff In Suprasternal Notch
- Fiberoptic Bronchoscopy